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Surveys of Soviet-Bloc Scientific and Technical Literature

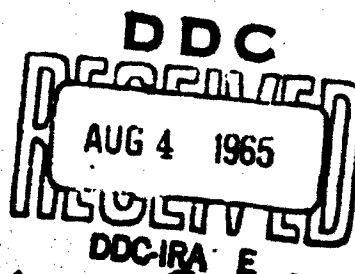
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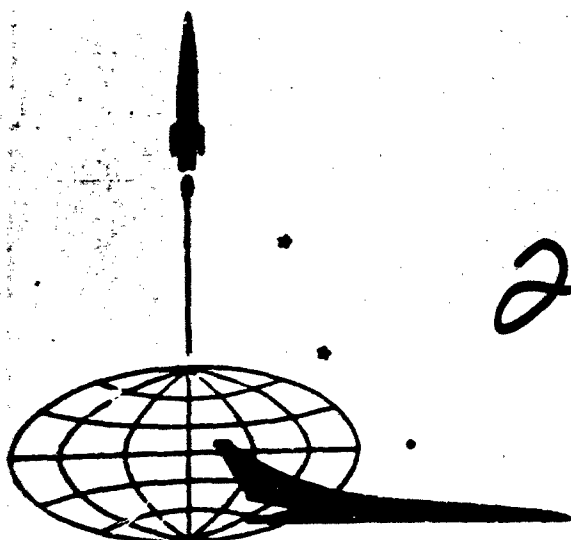


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FOREWORD

This report is published in response to ATD Work Assignment Number 50, which calls for the screening of available Soviet open-source literature for materials on or related to the following 15 topics:

GROUP I. AEROSOLS

- 1 - Aerosols: crop spraying
- 2 - Aerosols: immunization

GROUP II. BIOLOGICAL PATHOGENS

- 3 - Tularemia
- 4 - Anthrax
- 5 - Brucellosis
- 6 - Plague
- 7 - Botulinus toxin
- 8 - Viruses, etc.

GROUP III. ECOLOGY

- 9 - Ecology

GROUP IV. SOIL SCIENCE AND MICROMETEOROLOGY

- 10 - Soils
- 11 - Micrometeorology

GROUP V. CHEMICAL SUBSTANCES

- 12 - Psychochemicals, etc.

GROUP VI. AGRICULTURAL CHEMICALS

- 13 - Pesticides
- 14 - Herbicides

GROUP VII. MISCELLANEOUS

- 15 - Inventions, patents, etc.

The present report, compiled from sources published prior to 31 December 1962, is cast in bibliographic form and includes materials relating to topics in Groups I, II, and V. Materials on Group IV topics have already been reported in ATD Reports U-65-23, U-65-34, and P-65-18.

A few of the items in this report were relevant to more than one topic in different groups. These have simply been repeated, and will be found under each of the appropriate headings.

In this preliminary report, both annotated and unannotated materials have been included. Individual unannotated items, identified by evaluation of the preliminary report as possessing sufficient importance to warrant fuller treatment, will be abstracted later on a selective basis.

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CBE FACTORS

I. Aerosols

1. Aleksandrov, N. I., and N. Ye. Gefen. Aerosol immunization with dry live vaccines and anatoxins. Communication I. Theoretical and experimental premises in the development of a method of aerosol vaccination. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 31, no. 6, 1960, 7-11.

Disadvantages of parenteral methods of immunization (subcutaneous, intradermal, and skin) are discussed and ways of avoiding them pointed out. One way is to reduce the number of parenteral vaccinations by developing and using associated and adsorbed vaccines, and a second is to replace parenteral immunization methods by so-called physiological methods. Combined immunization methods — parenteral for primary vaccination and physiological for revaccination — may also be used. The most important of the physiological immunization methods is that of mass spontaneous aerosol immunization with dry vaccines of polydispersive fractional composition. The theoretical and experimental bases of the

described method are briefly presented, and references to previously published works of the authors on the development and testing of physiological (particularly aerosol) methods of immunization are given.

- Aleksandrov, N. I., N. Ye. Gefen, K. G. Gapochko, N. S. Garin, V. M. Sergeyev, Ye. S. Lazareva, V. V. Mischenko, and Ye. N. Shlyakhov. Aerosol immunization with dry live vaccines and anatoxins. Communication VI. Studies of the postvaccinal reaction and immunological effectiveness of aerosol immunization with dry vaccines (brucellosis, tularemia, anthrax, plague) in humans. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 32, no. 7, 1961, 56-62.

A study was made of the postvaccinal reactions and the immunological effectiveness of aerosol immunization with dry vaccines (brucellosis, tularemia, anthrax, and plague) in humans. Results of these investigations show that aerosol immunization with dry vaccines (brucellosis, tularemia, anthrax, and plague) used in a rational dosage is harmless and gives insignificant postvaccinal reactions. Aerosol immunization against brucellosis, tularemia, anthrax, and plague with the appropriate dry vaccines brings about pronounced immunological readjustment.

- Aleksandrov, N. I., N. Ye. Gefen, K. G. Gapochko, N. S. Garin, V. M. Sergeyev, and M. S. Smirnov. Aerosol immunization with dry live vaccines and anatoxins. Communication VII. Organization, methods, and technique of mass aerosol immunization of humans with dry vaccines. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 32, no. 9, 1961, 3-7.

Data are presented on the organization, methods, and technique of mass aerosol immunization of humans with dry vaccines in ordinary sized rooms, (5 to 160 m³). In such rooms 4 to 200 persons, respectively, may be immunized at a time. In mass aerosol immunization, the biological concentration of the aerosol and biological activity of the inhaled dose must be experimentally determined. The authors have compiled tables for estimating biological concentrations from the known values of the initial biological activity of aerosol vaccines, the volume of the room in which the aerosol immunization takes place, and the immunization exposure time.

4. Aleksandrov, N. I., N. Ye. Gefen, K. G. Gapochko, N. S. Garin, G. G. Koridze, I. N. Markozashvili, N. P. Osipov, M. P. Pishik, I. A. Posobilo, M. S. Smirnov, and V. P. Turov. Aerosol immunization with dry vaccines and anatoxins. Communication VIII. Study of a method of aerosol immunization with dry plague vaccines during mass immunization. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 33, no. 7, 1962, 46-50.

Aerosol immunization with dry live plague vaccine prepared from the EV strain (dose, 150-200 million microbes) caused no distinct reaction although it produced some changes in the peripheral blood. Field trial of this immunization method was quite simple and practicable for mass immunization against plague.

5. Aleksandrov, N. I., N. Ye. Gefen, K. G. Gapochko, N. S. Garin, A. I. Maslov, and V. V. Mischenko. Aerosol immunization with dry vaccines and anatoxins. Communication X. Clinical study of post-vaccinal reactions to aerosol immunization with dry brucellosis vaccine. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 33, no. 11, 1962, 31-37.

Aerosol immunization with dry live brucellosis vaccine prepared from the 19-BA strain (using optimal doses of 250-820 million microbes) on organisms not sensitized to brucella infection, was harmless. Aerosol immunization using this vaccine was accompanied by more frequent and marked postvaccinal reactions in persons sensitized to brucellosis. However, these reactions were harmless, brief, completely reversible, and did not differ in character from similar reactions in persons with a negative immunological background.

5. Bakanov, S. P., and B. V. Deryagin. Theory of thermal precipitation of highly dispersed aerosol systems. *Kolloidnyy zhurnal*, v. 21, no. 4, 1959, 377-384.

The behavior of a small aerosol particle ($\delta \ll \lambda$) in a nonuniformly heated gas is considered. While this particle does not change the velocity distribution of the gas molecules to any extent, it acquires an ordered velocity component by collision with gas molecules in addition to its disorderly Brownian movement. This component is shown by calculation to be directly proportional to $\text{grad } T$, and inversely proportional to the gas pressure and the square roots of the temperature and molecular weight of the gas. The direction of the velocity is opposite to $\text{grad } T$. Calculation was performed by the Chapman-Enskog method, using two procedures. In the first procedure, the thermodiffusion separation of an aerosol (similar to the thermodiffusion separation of a mixture of two gases) was considered. In the second procedure, the resultant force acting on an aerosol particle suspended in the gas was computed; the force was subsequently reduced to zero (condition for uniform motion). Both methods yielded corresponding results (for elastic impingement of gas molecules on the particle's surface). The second procedure also permitted treatment of diffusion reflection of gas molecules from the surface. The derived formula has numerical coefficient values approximately three times higher than Einstein's.

7. Berezovskiy, M. Ya. Aerosol method for use of herbicides. *Vestnik sel'skokhozyaystvennoy nauki*, v. 7, no. 4, 1962, 64-75.

The aerosol application of herbicides in ultralow-volume solutions was attempted by airspraying and surface application. A water emulsion of 2, 4D and a solution of 2, 4D in organic solvents were used. Results indicate that the number and size of the drops depend on the spraying method and the nature of the solution. Low-volume spraying increases efficiency three- to five-fold and reduces labor requirements and expenditures for chemical treatment of crops.

8. Bogdanov, V. S. Study of aerosols formed in the course of radio-chemical reactions. Zhurnal fizicheskoy khimii, v. 34, no. 5, 1960, 1044-1049.

The formation of aerosols and subsequent changes in them during irradiation of gaseous organic substances with fast electrons under various conditions were investigated by the light beam method. Aerosol particles formed from methane had radii of several microns, and carried either positive or negative charges from 1 to 11 elementary units. The majority (66%) were charged with from 1 to 3 units. The weight concentration and aerosol yield (molecules of CH_4 per 100 ev of absorbed energy) were investigated for aerosols obtained from methane. It was shown that the yield for ethylene is 32 times higher than the maximum achieved for methane.

9. Bolotovskiy, V. M. Theory of operation of the IVK-1 aerosol chamber for studying experimental respiratory infections. Report 1. Dynamics of operation of an aerosol chamber. Voprosy virusologii, v. 6, no. 4, 1961, 451-463.

The mechanism of the IVK-1 aerosol chamber is examined, and a mathematical equation of its operation presented. Formulae are also given for evaluating various factors: time required for reaching an equilibrium concentration of aerosol in the chamber; viability of the aerosol in the chamber; and elimination of the aerosol from the chamber after the experiment is over. These factors should be considered when any infectious material is used in aerosol chambers. These principles of use of an aerosol chamber may be applied to any analogous chamber.

- 9a. Bolotovskiy, V. M. Theory of operation of the IVK-1 aerosol chamber for studying experimental respiratory infections. Report 2. Evaluation of aerosols according to some physical parameters. Voprosy virusologii, v. 6, no. 4, 1961, 454-463.

The amounts (by weight) of infectious materials were determined when sprayed inside the chamber or passed through the respiratory tract of experimental animals. Comparative study of amounts of infectious material administered in various ways shows that mice receive 1/50 the amount of virus-containing suspension when infected by aerosol inhalation than with routine intranasal inoculation, even though a 100% mortality rate was observed using either route of infection. It was established that conditions in the IVK-1 aerosol chamber permit a stable aerosol to be obtained. Study of the distribution by size of aerosol particles showed that 80-90% of the particles can easily enter the lung alveoli of experimental animals.

10. Dukhin, S. S. Theory of the drift of aerosol particles in standing acoustic waves. Kolloidnyy zhurnal, v. 22, no. 1, 1960, 128-130.

A new mechanism for the drift of aerosol particles in a standing acoustic wave, leading to their periodic distribution, is proposed and theoretically discussed.

11. Dunskiy, V. F., and A. V. Kitayev. Precipitation of a unipolar charged aerosol in a closed room. *Kolloidnyy zhurnal*, v. 22, no. 2, 1960, 159-167.

An approximation theory was suggested for the precipitation of unipolar charged isodisperse and polydisperse aerosols in a closed room under ordinary conditions of air convection. Experiments were conducted on precipitation of a unipolar aerosol in a chamber with a volume of 1.2 m^3 . The charge was induced by atomizing the liquid in an electrical field. Theoretical and experimental results agree approximately, if it is assumed that the charges are distributed among the droplets in proportion to their radius. Some theories as to the possible causes of such a charge distribution are discussed.

12. Dunskiy, V. F., and N. S. Smirnov. The influence of ionizing radiation on the dispersion of aerosols. *Kolloidnyy zhurnal*, v. 21, no. 4, 1959, 436-441.

It was shown experimentally that condensation fogs become charged very slowly under conditions of natural atmospheric radiation. Irradiation of such fogs by Co^{60} gamma-quanta decreases the dispersion of microscopic particles and facilitates filtration of the finer fractions of the fog.

13. Rydel'shteyn, S. I. Experimental study of oxytetracycline aerosols. Antibiotiki, v. 6, no. 11, 1961, 971-974.

An experimental study was made of oxytetracycline aerosols. When inhaled for long periods, the antibiotic is absorbed by the blood. In high concentrations it inhibits the function of the intestinal ciliated epithelium in frogs, but fails to cause any significant changes in the respiratory passages and lungs of rats and rabbits (daily inhalation for 15 days). Oxytetracycline aerosols do not impair respiration and circulation.

14. Guzeyev, Yu. M. Treatment of tuberculosis of the bronchi and lungs by inhalation of garlic juice aerosols. Zhurnal ushnoy, nosovoy, i gorlovoy bolezny, v. 20, no. 5, 1960, 21-26.

Treatment by inhalation of garlic juice aerosols was given to 257 patients with pulmonary tuberculosis. Of this total, 51 patients had tuberculosis of the bronchi, and 42 had bronchiectasis as well. Garlic juice was inhaled during the first two days in a concentration of 1:10; during the following two days in a concentration of 1:6; and during the remainder of the 30 days of treatment in a concentration of 1:4. The juice was diluted with a 1% novocaine solution. Each inhalation treatment lasted 5-10 minutes. The data cited indicate the therapeutic value of this form of treatment. Best results were obtained by combining inhalation of garlic juice aerosols with antibiotic therapy.

15. Ignat'yev, V. I., and N. I. Zverev. Settling of aerosol particles on a cylinder. *Inzhenerno-fizicheskiy zhurnal*, no. 12, 1960, 17-23.

It was established experimentally, and by analysis of experiments on similarity criteria, that the investigated phenomenon is not uniquely determined by the criterion St , but depends also on criteria Re_d , Fr and Re^* . A derived criterion was obtained for C_d (6), which uniquely determines the similarity of motion of particles in the investigated range of values. It was experimentally established that, in the course of the process, gravity may considerably affect the motion not only of large particles but also of small particles with velocities from 0.01 to 0.0025 (equal to the velocity of the leading edge of the stream). Analysis of experiments shows that the effect of particle dimensions and the viscosity of the gas is considerably greater than would follow from criterion St . Experiments with hot air confirmed this conclusion with respect to viscosity.

16. Karol, I. L. Semi-empirical theory of vertical turbulent diffusion in the boundary layer of the atmosphere. *Inzhenerno-fizicheskiy zhurnal*, no. 4, 1960, 54-64.

The nonstationary problem of vertical turbulent diffusion of a homogeneous aerosol from an instantaneous point source in the boundary layer of the atmosphere was considered. The equation for the semi-empirical theory of turbulent diffusion was solved for initial conditions and boundary conditions, assuming that the coefficient of vertical turbulent diffusion K_z changes with height z . The problem was solved by using a unilateral Laplace transform over time t , and conditions were found when, owing to degeneration of the initial equation, a limited solution can be uniquely obtained independent of the boundary condition on the $z = 0$ level. It was established that this solution is a limit form of the solution of the problem with boundary conditions given on the level of the "roughness layers" $z = z_0$, when $z_0 \rightarrow 0$. Asymptotic expressions were obtained for a vertical distribution of aerosol concentration $q(z, \tau)$ and for aerosol flux on the ground $\Pi(\tau, z_0, \theta)$, for large values of nondimensional time τ and nondimensional height of the source χ .

7. Khelevtsov, S. S. A size-separation device for sampling aerosols from curvilinear flow. Akademiya nauk Kazakhskoy SSR. Astrofizicheskiy institut. Trudy, v. 3, 1962, 108-114.

A size-separation sampling device is described, and a method of determining the quantity and size of airborne particles is suggested. The device permits capturing of small particles ($0.7-0.8 \mu$). No difference was observed between the size distribution obtained by the trap and that determined by microphotography.

8. Kogan, Ya. I., and Z. A. Burnasheva. Growth and measurement of condensation nuclei in a continuous stream. Zhurnal fizicheskoy khimii, v. 34, no. 12, 1960, 2630-2639.

In this method, nucleus growth takes place by condensation in a continuous stream of supersaturated vapors of substances with very small equilibrium vapor pressures at room temperature. Supersaturation is created by mixing streams of different temperatures. The enlarged particles are sufficiently stable to permit determination of their size and concentration by nephelometric and ultramicroscopic measurements. The calibration function for the ratio between the intensity i of scattered light and the particle size (radius, 0.015 to 3.0μ) is presented. It is shown that the radius r' of the enlarged particles does not depend on the size of the nuclei r , nor on their concentration n , if $n \leq 10^3/\text{cm}^3$. Under these conditions, the brightness of the monodisperse enlarged aerosol in the nephelometer is proportional to the nuclear count, and measurement of the factor of brightness increase during growth $\eta = i'/i$ permits a simple determination of the mean nucleus size. The sensitivity of the method to weight concentrations of the smaller nuclei reaches $10^{-20} \text{ g}\cdot\text{cm}^{-3}$.

19. Kolomyets, G. K. Counter for determining the concentration and size distribution of natural aerosols in the troposphere. *Izvestiya Astrofizicheskogo instituta Akademii nauk Kazakhskoy SSR*, v. 11, 1961, 111-115.

The article describes a new design for a counter for determining the concentration and size distribution of natural aerosol particles. This counter can be used to determine the concentration and size distribution of fog droplets as well. Differences between this counter and previous counters of the same type are shown. Results of observations conducted in the fall of 1959 and spring of 1960 at the Mountain Observatory belonging to the Astrophysical Institute of the Kazakh Academy of Sciences, near Alma-Ata (elevation, 1450 m above sea level) are given.

20. Kulik, N. M. Influence of hyaluronidase aerosols on the absorbability of inhaled antitubercular preparations. *Vrachebnoye delo*, no. 6, 1962, 74-77.

Hyaluronidase aerosols were used to increase the absorption properties of inhaled antitubercular preparations. Results were evaluated by determining para-aminosalicylic acid in the urine. Three hundred and ten determinations were made for 41 patients. It was found that hyaluronidase aerosols increase the absorption properties of inhaled antitubercular preparations, causing no side effects. The use of hyaluronidase aerosols with antitubercular preparations for treatment of cavernous forms of pulmonary tuberculosis is recommended.

1. Lerner, I. P., and F. V. Andrushchenko. Treatment of chronic cor pulmonale with cardiac glycoside aerosols. Vrachebnoye delo, no. 5, 1961, 22-25.

Cardiac glycoside aerosols (strophanthin, corglycon, convallotoxin) were used for treatment of patients with chronic cor pulmonale complicated by circulatory insufficiency. It was found that glycoside aerosols are an effective method of treatment having some advantages over intravenous glycosides (less danger of thrombus mobilization, prevention of "strophanthin death," etc.). Absorption of glycoside aerosols from the broncho-pulmonary system into the bloodstream is slow. The large surface area of the aerosols gives the drug (by deep penetration into the lungs) greater effectiveness on the receptors of the respiratory apparatus. When necessary, cardiac glycosides may be combined with other drugs (antibiotics, broncholytics), and desensitizing preparations) in the aerosol mist.

2. Lyshevskiy, A. Concentration fields of an atomized liquid in an axisymmetric stream. Inzhenerno-fizicheskiy zhurnal, no. 2, 1961, 27-32.

A method is presented for experimental determination of the concentration fields of an atomized liquid in the principal section of an axisymmetric stream, and the results of such an investigation are analyzed in dimensionless parameters. It was established that complete similarity of concentration fields exists in the principal section of an axisymmetric stream of atomized liquid. Applying similarity criteria to analysis of experimental data, a quantitative relationship was obtained for determining liquid flow in the principal section of the stream during atomization of liquids by ordinary open mechanical-pressure nozzles with cylindrical nozzle openings.

23. Makarovskaya, L. N. Dry streptomycin aerosols in prompt plague prophylaxis. Antibiotiki, v. 5, no. 3, 1960, 38-41.

In guinea pigs and white mice intranasally inoculated with a virulent strain of *Pasteurella pestis*, a single application of streptomycin in the form of dry aerosol occasionally sufficed to prevent development of the disease. The best preventive effect was obtained when streptomycin administration was begun shortly before or soon after inoculation with the plague pathogen.

24. Maslov, A. I. Effectiveness of the inhalation method of immunization. Communication II. The immunological effectiveness of inhalation immunization with killed vaccine utilizing medium and finely dispersed aerosols. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 31, no. 4, 1960, 10-15.

White mice, guinea pigs, and rabbits were placed in a special chamber, where a vaccine aerosol with a definite density and dispersion rate was created by dispersing thick suspensions of killed bacteria. It was shown that inhalation immunization with killed *Salmonella enteritidis* vaccine causes pronounced immunological readjustment, shown by sharp increase of agglutinin titres and good indices of the serum preventive properties. Vaccine aerosols with particles ranging in size from 4 to 10 μ gave much higher immunological indices than those made up of larger particles. In triple immunization of rabbits with finely dispersed vaccine aerosol, the average agglutinin titres reached 1:29440, 8.3 times greater than agglutinin titres obtained with triple subcutaneous vaccination. The serum preventive properties in animals immunized by the inhalation method were also higher. Reactions to the inhalation method were insignificant and no more intense than reactions to subcutaneous inoculations.

5. Muromtsev, S. N., and V. P. Nenashev. A study of aerosols. Communication III. Ultrasonic atomizer for aerosols. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 31, no. 10, 1960, 50-56.

An ultrasonic atomizer is described and data concerning use are given. Physiological saline solution and various biological objects (suspensions of bacteria and toxoid) were dispersed using the atomizer. Aerosols obtained with the ultrasonic atomizer were nearly monodisperse and within the size range capable of deep penetration into all portions of the respiratory tract. The weak destructive effect of ultrasound on the irradiated objects was noted.

26. Muromtsev, S. N., and V. P. Nenashev. Study of aerosols. Communication IV. An insulated chamber for experiments with inhalation immunization. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 32, no. 9, 1961, 25-26.

The paper describes an insulated chamber and its equipment for experiments on inhalation immunization of laboratory animals.

27. Nikitin, P. I., K. K. Luneva, and N. I. Fomicheva. Disinfection of surfaces with small doses of disinfectants by means of pneumatic atomizers. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 33, no. 8, 1962, 30-34.

The effectiveness of disinfection with various disinfectants (applied with pneumatic atomizers) was studied in laboratory and practical conditions. So-called aerosol disinfection, with the disinfectants atomized by pneumatic atomizers and compressed air (pressure, to 5 atm) is actually moist disinfection. The amount of consumed disinfectant was 2 to 3 times less than the amount required for disinfection with hydraulic apparatus: however, with the former method more time was required for fine atomization of the disinfecting solution. One and three percent chloramine solutions, a 0.5% activated chloramine solution, and a 3% phenol and sodium oxydiphenolate solution were effective in disinfection of hard polished surfaces in a dose of not less than 33-50 ml per 1 m². Polished surfaces withstood four applications of 3% and six applications of 1% chloramine solution.

28. Pen'ko, A. S. Atomization of liquids. Inzhenerno-fizicheskiy zhurnal, v. 4, no. 12, 1961, 47-51.

Equations are given for calculating the degree of pulverization (r) for uses as an initial data in choosing a pulverizing device to meet practical requirements.

29. Radushkevich, L. V. New method for determining the efficiency of deposition of aerosols from a flow on a stationary cylinder. Zhurnal fizicheskoy khimii, v. 35, no. 8, 1961, 1870-1873.

A method is proposed for determining the efficiency of deposition of aerosols from a flow on a stationary cylinder. A polydisperse aerosol with controlled size distribution of particles is used. In this way equal conditions are established in a single experiment for deposition of different fractions on a given cylinder at a given flow velocity. The method is of particular importance for investigating selective deposition, and (since the deposited particles are counted directly) can be employed for cases when the particle diameter exceeds that of the cylinder.

30. Reshetov, V. D. Unipolar charges of aerosols. Zhurnal fizicheskoy khimii, v. 34, no. 6, 1960, 1320-1325.

Observations of the electrophoresis of aerosols indicates that a unipolar charge is imparted to the aerosol droplets or particles. The sign of the charge depends on whether the particles are acid or basic. If the particles or droplets have a $\text{pH} < 5$, they will be charged negatively with respect to air; if their $\text{pH} > 5$, they will have a positive charge. The phenomenon may be explained by the selective adsorption of hydrogen ions.

31. Serebryanaya, M. F., and N. A. Krotova. Deformation and atomization of colloid systems in the vicinity of an electrically charged surface. *Kolloidnyy zhurnal*, v. 22, no. 1, 1960, 82-89.

The deformation and atomization of small volumes of carbon-black suspensions in vaseline oil and printing inks in the field of a uniformly electrified surface were investigated. Deformation of the drops was explained by migration of the charged particles of the disperse phase to the surface, entraining the dispersion medium in their movement. In the absence of the disperse phase, the medium does not react to the approach of an electrified surface. When a sufficient number of charged particles accumulates at the surface of the droplet, it atomizes owing to repulsion of like charged particles and drop in surface tension. The processes of deformation and atomization alternate. With the aid of high velocity cinematography, the magnitudes of deformation as a function of the distance from the electrified surface were measured, as well as the sizes and shapes of the atomizing particles and the rate of atomization. The possibility of using these phenomena in contactless printing and electrostatic aerography is pointed out.

32. Terskikh, I. I., V. M. Bolotovskiy, and A. Yu. Bekleshova. Characteristics of aerosol infection in ornithosis. *Voprosy virusologii*, v. 6, no. 4, 1961, 463-469.

The pathogenesis and clinical picture of ornithosis were studied using mice and monkeys infected by inhalation of pure ornithosis virus aerosol in a special chamber. Four to seven days later, the monkeys showed characteristic lung lesions analagous to those in humans with ornithosis. The patterns of distribution and accumulation of the virus in the blood and organs of mice and of the development of pathomorphological indicate that primary localization of the agent and development of the pathological process occurs in the respiratory tract. This is followed by hematogenic spread of the infection and development of lesions in parenchymatous organs. Aerosol infection with ornithosis is characterized by diffuse lung lesions followed by the development of larger, rapidly consolidating pneumonic foci. The development of lung lesions is correlated with the incubation period and the rise of virus titre in lung tissue. Consideration of the basic method of infection in ornithosis and its pathogenesis are essential to the devising of effective therapy and epidemic countermeasures.

- . Titarenko, I. F. Experimental observations of (polyvaccine) immunization with anatoxin aerosols (tetanus and staphylococcus). Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 33, no. 2, 1962, 8-14.

Highly purified concentrated anatoxins (tetanus and staphylococcus) administered by the inhalation method produced a marked immunological reaction in guinea pigs and rabbits. There were no essential differences between the antibody titres of animals subjected to mixed staphylococcus-tetanus immunization and those immunized separately with aerosols of the aforementioned antigens. A direct relationship was noted between the rise of antitoxin titre and the increase of dose of one or another component of anatoxin mixture: some inhibition of tetanus antibody production was noted following administration of a triple dose of staphylococcus anatoxin. Aerosol reimmunization following primary subcutaneous vaccination was especially effective. Electrophoretic study of the serum of experimental guinea pigs showed an approximately two-fold rise of globulin, and some increase of the β -globulin fractions.

- . Todes, O. M., V. F. Fedorov, and A. A. Chekunov. Experimental study of light scattering of coagulating aerosols. Kolloidnyy zhurnal, v. 22, no. 1, 1960, 90-96.

The effect of coagulation on the optical properties of aerosol particles was studied. An expression was derived, describing changes in these properties on coagulation of the particles in a confined space and in an aerosol cloud dispersing in the atmosphere. Movement of a dispersing cloud in the atmosphere at some distance from the source is shown to cause only slight changes in the optical properties of the aerosol particles. The theoretical function was confirmed experimentally, using aerosols of sulfuric acid and phosphoric acid, and fuel oil fumes. The wavelength of the light subject to scattering was 0.55 and 3.4 μ . The initial aerosol concentration varied from 3.1 to 0.08 g/m³.

35. Vlodavets, V. V. Experimental model of the dry phase of a bacterial aerosol. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 31, no. 10, 1960, 56-62.

Dust obtained from blankets was first sifted through a sieve and then sterilized by dry heat at 150-160°C for a period of 2 hours: 0.8 to 1 g of the dust was contaminated with 10 to 12 ml of thick *Staphylococcus albus* suspension in saline (40 to 50 billion microbes per ml). Bacterial dust dried in a thermostat was triturated in a mortar, and then various samples of bacterial dust were dispersed in an experimental chamber. Batches of 20 to 30 mg were most convenient. Bacterial dust prepared in this manner can only be used for a period of 5 to 10 days, due to the rapid death of staphylococci. Dust dried by lyophilization and kept at a temperature of 2 to 4°C may be used for serial experiments for at least 35 days, while dust kept at room temperature and 37°C may be used for at least 20 days.

36. Vlodavets, V. V., S. Ya. Gaydamovich, and V. R. Obukhova. Technique for detection of influenza virus in the drop phase of aerosols. Communication II. Effectiveness of detecting influenza virus with Rechemskiy's bacterial recovery apparatus, Vershigora's barbotage apparatus, and Shafir's aerocentrifuge. Voprosy virusologii, v. 8, no. 6, 1960, 670-675.

Studies were made of the effectiveness of aerosols of various adsorbing fluids in trapping influenza virus in Rechemskiy's bacterial recovery apparatus, Vershigora's barbotage apparatus, and Shafir's aerocentrifuge. It was found that with Rechemskiy's apparatus, the adsorption and detection of influenza virus were optimal in glucose broth and milk, while with Vershigora's barbotage apparatus and Shafir's aerocentrifuge, milk and a 10% chicken red cell suspension in saline were best. A comparative study of all apparatus, using the most effective adsorbing fluids, showed that Rechemskiy's apparatus possesses the highest detecting ability with respect to influenza virus aerosol. The next most effective was Vershigora's barbotage apparatus, followed by Shafir's aerocentrifuge and D'yakonov's apparatus. Krotov's apparatus and soluble gelatin foam filters were the least effective.

7. Yakubovich, M. M. Particle size distribution of the disperse phase in a polydisperse aerosol system. *Kolloidnyy zhurnal*, v. 22, no. 6, 1960, 748-75.

A solution to the problem of finding the particle size distribution function for the disperse liquid phase in a polydisperse mist of low-volatile liquid is presented. The problem was solved on the basis of experimental data concerning the time change in the weight and particle concentration of the mist. In this respect the solution differs from the method used for deriving a distribution function for hydrosols. The equation obtained expresses the dependence of the distribution function value for a given droplet volume on time and on the rate constant of coagulation determined in the process of solution.

38. Zaytseva, K. A., Yu. V. Shukenov, and M. A. Al'tshuler. Gravity deposition of aerosols from a laminar flow. *Kolloidnyy zhurnal*, v. 23, no. 6, 1961, 687-689.

The possibility of determining the boundary diameters of droplets deposited by the action of gravity from a laminar flow was experimentally tested. Experimental values for the boundary diameter agreed with the theoretical values within the limits of experimental error. This demonstrates the possibility of utilizing boundary diameter measurements to study the kinetics of vaporization and condensation growth of volatile particles.

II. Biological Pathogens

39. Akatov, A. K., and Z. I. Lebedeva. Quantitative interrelation between the phosphatase activity, pathogenicity, and penicillin resistance of staphylococci. *Antibiotiki*, v. 6, no. 4, 1961, 363-368.

In the course of quantitative investigation of phosphatase activity in 100 staphylococcus strains, acid phosphatase was observed in 89 (with phosphorus activity indices of 0.4% to 39.7%) and alkaline phosphatase in 52 strains (0.2% to 20.1%). It was shown that the quantity of phosphatase in the staphylococci did not depend on level of penicillin resistance, hemolytic activity, or rate of plasma coagulation. It is concluded that the amount of phosphatase cannot serve as a criterion of the degree of pathogenicity or as an index of the penicillin resistance of staphylococcus.

40. Aleksandrov, N. I., and N. Ye. Gefen. Aerosol immunization with dry live vaccines and anatoxins. Communication I. Theoretical and experimental premises in the development of a method of aerosol vaccination. *Zhurnal mikrobiologii, epidemiologii i immunobiologii*, v. 31, no. 6, 1960, 7-11.

Disadvantages of parenteral methods of immunization (subcutaneous, intradermal, and skin) are discussed and ways of avoiding them pointed out. One way is to reduce the number of parenteral vaccinations by developing and using associated and adsorbed vaccines, and a second is to replace parenteral immunization methods by so-called physiological methods. Combined immunization methods — parenteral for primary vaccination and physiological for revaccination — may also be used. The most important of the physiological immunization methods is that of mass, spontaneous aerosol immunization with dry vaccines of polydispersive fractional composition. The theoretical and experimental bases of the described method are briefly presented, and references to previously published works of the authors on the development and testing of physiological (particularly aerosol) methods of immunization are given.

Aleksandrov, N. I., N. Ye. Gefen, K. G. Gapochko, N. S. Garin, V. M. Sergeyev, Ye. S. Lazareva, V. V. Mischenko, and Ye. N. Shlyakov. Aerosol immunization with dry live vaccines and anatoxins. Communication VI. Studies of the postvaccinal reaction and immunological effectiveness of aerosol immunization with dry vaccines (brucellosis, tularemia, anthrax, plague) in humans. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 32, no. 7, 1961, 56-62.

A study was made of the postvaccinal reactions and the immunological effectiveness of aerosol immunization with dry vaccines (brucellosis, tularemia, anthrax, and plague) in humans. Results of these investigations show that aerosol immunization with dry vaccines (brucellosis, tularemia, anthrax, and plague) used in a rational dosage is harmless and gives insignificant postvaccinal reactions. Aerosol immunization against brucellosis, tularemia, anthrax, and plague with the appropriate dry vaccines brings about pronounced immunological readjustment.

Aleksandrov, N. I., N. Ye. Gefen, K. G. Gapochko, N. S. Garin, V. M. Sergeyev, and M. S. Smirnov. Aerosol immunization with dry live vaccines and anatoxins. Communication VII. Organization, methods, and technique of mass aerosol immunization of humans with dry vaccines. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 32, no. 9, 1961, 3-7.

Data are presented on the organization, methods, and technique of mass aerosol immunization of humans with dry vaccines in ordinary sized rooms (5 to 160 m³). In such rooms, 4 to 200 persons, respectively, may be immunized at a time. In mass aerosol immunization, the biological concentration of the aerosol and biological activity of the inhaled dose must be experimentally determined. The authors have compiled tables for estimating biological concentrations from the known values of the initial biological activity of aerosol vaccines, the volume of the room in which the aerosol immunization takes place, and the immunization exposure time.

43. Aleksandrov, N. I., N. Ye. Gefen, K. G. Gapochko, N. S. Garin, G. G. Koridze, I. N. Markozashvili, N. P. Osipov, M. P. Pischik, I. A. Posobilo, M. S. Smirnov, and V. P. Turov. Aerosol immunization with dry vaccines and anatoxins. Communication VIII. Study of a method of aerosol immunization with dry plague vaccines during mass immunization. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 33, no. 7, 1962, 46-50.

Aerosol immunization with dry live plague vaccine prepared from the EV strain (dose, 150—200 million microbes) caused no distinct reaction although it produced some changes in the peripheral blood. Field trial of this immunization method was quite simple and practicable for mass immunization against plague.

44. Aleksandrov, N. I., N. Ye. Gefen, K. G. Gapochko, N. S. Garin, A. I. Maslov, and V. V. Mischenko. Aerosol immunization with dry vaccines and anatoxins. Communication X. Clinical study of post-vaccinal reactions to aerosol immunization with dry brucellosis vaccine. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 33, no. 11, 1962, 31-37.

Aerosol immunization with dry live brucellosis vaccine prepared from the 19-BA strain (using optimal doses of 250—820 million microbes) on organisms not sensitized to brucella infection, was harmless. Aerosol immunization using this vaccine was accompanied by more frequent and marked postvaccinal reactions in persons sensitized to brucellosis. However, these reactions were harmless, brief, completely reversible, and did not differ in character from similar reactions in persons with a negative immunological background.

45. Bass, T. M. Inhibition of developing resistance of staphylococci to erythromycin. *Antibiotiki*, v. 7, no. 11, 1962, 1038-1042.

46. Blyumberg, N. A., and I. D. Ryabova. Some antiviral properties of mutomycin antibiotic. *Antibiotiki*, v. 7, no. 1, 1962, 35-39.

A study was conducted of the antiviral properties of the antibiotic mutomycin, isolated at the Institute for Research in New Antibiotics, Academy of Medical Sciences USSR. A dose of 20 to 5 γ /ml of the antibiotic inhibited the development of 6500 ID₅₀ influenza virus on slices of chorioallantoic membrane. Mutomycin inactivated the influenza virus strain in experiments *in vitro* with surviving tissue cultures, chick embryos, and white mice. Mice were inoculated with a minimal lethal dose of influenza virus to determine the activity of the drug in both intranasal and subcutaneous administration. Although mutomycin did not inhibit the development of influenza virus *in ovo*, it did prove active against the smallpox vaccine strain *in vitro* and possessed virocidal activity in chick embryos. Though it did not increase the life span of chick embryos infected with the smallpox vaccine strain, the drug did produce a five-fold decrease in the hemagglutination titre of chorioallantoic membrane suspension. Preliminary data indicated that mutomycin has some activity against adenovirus in tissue cultures.

47. Bolotovskiy, V. M. Theory of operation of the IVK-1 aerosol chamber for studying experimental respiratory infections. Report 1. Dynamics of operation of an aerosol chamber. Voprosy virusologii, v. 6, no. 4, 454-463.

The mechanism of the IVK-1 aerosol chamber is examined, and a mathematical equation of its operation presented. Formulae are also given for evaluating various factors: time required for reaching an equilibrium concentration of aerosol in the chamber; viability of the aerosol in the chamber; and elimination of the aerosol from the chamber after the experiment is over. These factors should be considered when any infectious material is used in aerosol chambers. These principles of use of an aerosol chamber may be applied to any analogous chamber.

48. Bolotovskiy, V. M. Theory of operation of the IVK-1 aerosol chamber for studying experimental respiratory infections. Report 2. Evaluation of aerosols according to some physical parameters. Voprosy virusologii, v. 6, no. 4, 454-463.

The amounts (by weight) of infectious materials were determined when sprayed inside the chamber or passed through the respiratory tract of experimental animals. Comparative study of amounts of infectious material administered in various ways shows that mice receive 1/50 the amount of virus-containing suspension when infected by aerosol inhalation than with routine intranasal inoculation, even though a 100% mortality rate was observed using either route of infection. It was established that conditions in the IVK-1 aerosol chamber permit a stable aerosol to be obtained. Study of the distribution by size of aerosol particles showed that 80-90% of the particles can easily enter the lung alveoli of experimental animals.

- Bystrova, V. V. The effect of some antibiotics on the course of aseptic inflammation. Antibiotiki, v. 7, no. 1, 1962, 52-56.

A study was made on 942 rats of the effect of tetracycline series antibiotics, penicillin, and levomycetin on the morphology of aseptic inflammation caused by an injection of a combination of turpentine and sunflower oil into the subcutaneous cellular tissue of experimental animals. In the first series of experiments, various antibiotics were administered in different doses for the first 10 days after turpentine injection. The second series studied the effect of preliminary saturation of the organism of the animals with antibiotics of the tetracycline group. In the third series, antibiotics were administered after the development of the inflammatory reaction, i. e., beginning with the third day after turpentine injection. None of the three series gave any morphological indication of the action of antibiotics on the clinical course of aseptic inflammation.

- 0. Dergachev, I. S., I. N. Potapova, and G. A. Mikhayeva. The effect of chlortetracycline on the course of experimental staphylococcus infection. Antibiotiki, v. 7, no. 1, 1962, 65-68.

A study was made of the effect of chlortetracycline on the course of an experimental staphylococcus infection in rabbits aged 3 weeks and one month. It was found that a dose of 10 mg/kg of chlortetracycline has a good prophylactic action if administered several days prior to inoculation of the animals with staphylococcus. When treatment was started 1.5 days following subcutaneous and intravenous inoculation with staphylococcus, chlortetracycline did not check the development of staphylococcus sepsis but merely prolonged the life of the rabbits.

51. Derkach, V. N., and I. I. Gol'bits. Study of the effect of antibiotics on the antigen characteristics of diphtheria toxins and anatoxins in experiments utilizing diffusion precipitation in gel. Antibiotiki, v. 6, no. 2, 1961, 153-158.

An experimental study was made of the effect of penicillin, chlortetracycline, sanasin, and levomycetin on the properties of diphtheria toxins and anatoxins; the method used was diffusion precipitation in gel. It was found that diphtheria toxins and anatoxins of various series precipitate diffusely in agar gel with diphtheria antitoxin serum. Penicillin and mycerin have no effect, levomycetin and sanasin weaken, and chlortetracycline completely neutralizes the precipitation properties of diphtheria toxins. Penicillin, mycerin, levomycetin, and sanasin have no effect on diphtheria anatoxins, while chlortetracycline completely neutralizes their precipitation capacity.

52. Edel'shteyn, S. I. Experimental study of oxytetracycline aerosols. Antibiotiki, v. 6, no. 11, 1961, 971-974.

An experimental study was made of oxytetracycline aerosols. When inhaled for long periods, the antibiotic is absorbed by the blood. In high concentrations it inhibits the function of the intestinal ciliated epithelium in frogs, but fails to cause any significant changes in the respiratory passages and lungs of rats and rabbits (daily inhalation for 15 days). Oxytetracycline aerosols do not impair respiration and circulation.

53. Eydel'shteyn, S. I., Ye. S. Zhilinskiy, and S. M. Gol'tser. Employment of tetracycline series aerosols during catarrhal and purulent inflammation of the upper respiratory tract. Antibiotiki, v. 7, no. 1, 1962, 68-71.

Oxytetracycline aerosols were used to treat 372 cases of catarrhal and pyrogenous diseases of the upper respiratory tract. From 50,000 to 100,000 units of the antibiotics were utilized for one inhalation. The patients tolerated this therapy well. This therapy resulted in full recovery in 65.5% of the cases treated, and improvement (without full recovery) in 26.2% of all cases treated. This therapy was especially successful against acute catarrh of the upper respiratory passages, acute rhinopharyngitis, and acute laryngotracheitis. Slight side effects developed in 12 cases. These were easily controlled by adding dimedrol to the inhaled solution.

54. Fortushnyy, V. A., and O. I. Yezhova. Sensitivity of pathogenic microorganisms to antibiotics. Antibiotiki, v. 6, no. 5, 1961, 441-442.

55. Frantsevich, L. I., and O. V. Viktorov-Nabokov. Dispensing small doses of poisons using calibrated capillary tubes. *Laboratornoye delo*, no. 4, Apr 1962, 58-59.

56. Gamaleya, L. A. Sensitivity of pathogenic staphylococci to some combinations of antibiotics. *Antibiotiki*, v. 7, no. 11, 1962, 1035-1038.

The effect of tetracycline in combination with oleandomycin, novobiocin, and erythromycin on pathogenic staphylococci was studied. The adaptability to these drugs of some staphylococcus strains was also studied. It was shown that staphylococci sensitive to both of the antibiotics in each combination were more sensitive to the combinations rather than to either drug alone. Resistance of staphylococcus strains to combinations of these antibiotics developed much more slowly during adaptation to the above-mentioned drugs. The strains adapted to oleandomycin and erythromycin showed a full cross-resistance. Sensitivity of these strains underwent practically no changes when these drugs were combined with tetracycline.

Geyzlar, M., and B. Lukash (Hejzlar, M., and B. Lukas). *In vitro* study of the sensitivity of *Pasteurella tularensis* and some other Pasteurellidae to antibiotics. Antibiotiki, v. 7, no. 2, 1962, 135-140.

Sensitivity to 15 antibiotics (bacteriostasis) was studied in 32 strains of the *Pasteurella* genus (*Pasteurella tularensis*, *Pasteurella pestis*, *Pasteurella multocida*, *Pasteurella hemolytica*) by the dilution plate method. All of the examined strains were most highly sensitive to tetracyclines (range of effective concentrations, 0.05 to 1.0 γ /ml). Canamycin, neomycin (0.02 to 2.0 γ /ml) and streptomycin (0.02 to 5.0 γ /ml) were also very effective. Chloramphenicol and novobiocin were effective in higher concentrations (0.6 to 20.0 γ /ml and 0.02 to 25.0 γ /ml, respectively). Polymyxin was ineffective in concentrations up to 100 γ /ml.

- Godovanny, B. A. Primary sensitivity of *Micrococcus pyogenes* to tetracycline series antibiotics and changes in it during chlortetracycline treatment of staphylococcal dermatitis. Antibiotiki, v. 6, no. 3, 1961, 276-279.

A study was made of the primary sensitivity of pyogenic staphylococcus to antibiotics of the tetracycline series, and of changes in primary sensitivity in the course of chlortetracycline therapy of staphylococcal dermatitis. It was found that all of the 75 staphylococcal strains isolated for the first time (92% of them pathogenic) were highly sensitive to antibiotics of the tetracycline series from 0.0195 to 2.5 γ /ml). It should be noted that the majority of the strains were sensitive to chlortetracycline. It was also found that chlortetracycline therapy produced a barely perceptible increase in tetracycline resistance of staphylococcus strains: a 2- to 16-fold rise in resistance to chlortetracycline, and not more than a 4-fold increase in resistance to oxytetracycline and tetracycline. Superficial changes in the biological properties of staphylococcus were observed during chlortetracycline therapy. These did not, however, include loss of pathogenicity.

59. Gromova, Ye. A., K. N. Tkachenko, and G. A. Romanova. Experimental basis for aminazine therapy of tetanus. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 12, 1961, 38-43.

Chronic experiments were performed on rabbits with electrodes implanted in the brain. The role of the reticular formation in the origin of motor disturbances in tetanus was established. It was shown that aminazine blocking of the reticular formation eliminates nonspecific afferent stimulations (e. g., auditory, tactile, etc.) from the symptom complex of tetanus. This is evidently the basis of the mechanism of its therapeutic effect.

60. Guzeyev, Yu. M. Treatment of tuberculosis of the bronchi and lungs by inhalation of garlic juice aerosols. Zhurnal ushnoy, nosovoy, i gorlovoy bolezny, v. 20, no. 5, 1960, 21-26.

Treatment by inhalation of garlic juice aerosols was given to 257 patients with pulmonary tuberculosis. Of this total, 51 patients had tuberculosis of the bronchi, and 42 had bronchiectasis as well. Garlic juice was inhaled during the first two days in a concentration of 1:10; during the following two days in a concentration of 1:6; and during the remainder of the 30 days of treatment in a concentration of 1:4. The juice was diluted with a 1% novocaine solution. Each inhalation treatment lasted 5-10 minutes. The data cited indicate the therapeutic value of this form of treatment. Best results were obtained by combining inhalation of garlic juice aerosols with antibiotic therapy.

61. Ilyukhin, A. V. Viability assay of transfused leukocytes. Problemy gematologii i perelivaniya krovi, v. 7, no. 2, 1962, 33-38.

62. Ivanova, L. G., T. I. Sergeyeva, N. V. Ploskirev, and N. N. Sitnikova. Dry medium for diagnosing food poisoning by Clostridium botulinum and Clostridium perfringens. Laboratornoye delo, no. 4, 1962, 33-36.

63. Kalina, G. P. A simplified method for differential Gram staining of bacteria. Laboratornoye delo, no. 1, 1962, 51-53.

64. Kalina, G. P. Some additional details on the one-step Gram staining method. Laboratornoye delo, no. 4, 1962, 59.

65. Karpenko, E. P., and M. G. Khovanskaya. Effect of penicillin on tissue respiration in healthy animals and in the state of shock. Antibiotiki, v. 7, no. 6, 1962, 522-527.

Under normal conditions, intramuscular administration of penicillin has no essential effect on tissue respiration in liver, brain, and cardiac muscle tissue. Under conditions of traumatic (operative) shock, tissue respiration in liver and cardiac muscle tissue decreases. Preliminary intramuscular administration of penicillin increases the stability of cellular respiration in the myocardium during traumatic shock.

66. Kaytmazova, Ye. I. Study of the effect of therapy with combinations of antibiotics during experimental brucellosis. Antibiotiki, v. 7, no. 4, 1962, 324-327.

The high efficacy of antibiotics in combination with chemodrugs compared to their effectiveness when used alone is well known. The present study shows that combined chlortetracycline and streptomycin therapy of experimental brucellosis in white mice is much more effective than the individual application of these antibiotics. Observations also show that when therapy is begun only on the 6th day after infection, a longer course of treatment is required than when therapy was begun more promptly after the onset of infection.

67. Khudanov, L. Ye., Ye. D. Shkurko, Ye. I. Kuptsevich, and G. G. Kulikova. Chemotherapy of experimental cholera. Antibiotiki, v. 7, no. 4, 1962, 331-334.

It was demonstrated that polymyxin, oxytetracycline and streptomycin have a pronounced medical effect on experimental cholera in white mice. The medical action of mycerin, colimycin, monomycin tetracycline, bicillin, and sulfodimesine is less evident. The combination of tetracycline and sulfodimesine with γ -globulin gives somewhat better results than chemotherapy alone.

68. Kremlev, G. I. Effect of antibiotics on the tetanus agent pathogen in experiments *in vivo* and *in vitro*. Antibiotiki, v. 7, no. 10, 1962, 907-911.

The effect of penicillin, chlortetracycline, and streptomycin on the tetanus pathogen *in vitro* and in nonimmunized white rats was studied. Penicillin proved to be the most active. White rats inoculated with a lethal dose of *Clostridium tetani* can be prevented from developing tetanus by repeated administration of antibiotics not more than 12 hours after the inoculation. It is advisable to administer a combination of antibiotics. The antibiotics under study can evidently be used for urgent specific prophylaxis of tetanus without the employment of antitetanus serum.

9. Kryzhanovskiy, G. N., L. A. Pevnitskiy, V. N. Grafova, and A. A. Polgar. Routes of tetanus toxin attack on the CNS and some problems of the pathogenesis of experimental tetanus. Report 3. Experiments on monkeys and dogs. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 11, 1961, 35-43.

It has been shown by experiments on monkeys and dogs that the main direct route of tetanus toxin from the muscles to the spinal cord is the anterior spinal roots. This result agrees fully with data from previous investigations on albino rats, guinea pigs, rabbits, and cats. If the circulatory route of toxin spread is blocked by antiserum, intramuscular injection of toxin in the posterior extremity causes a fatal ascending tetanus in dogs; by the time of the animal's death, antitoxin may be in circulation in the blood. Spread of toxin by the blood is thus not prerequisite to the development of general fatal tetanus, though this factor is important in determining the clinical form and the outcome of the disease. In both monkeys and dogs, generalized CNS excitation results from stimulation of the toxin-injected extremity; this phenomenon is characteristic of ascending general tetanus, and has already been described by the authors. Clinical forms of tetanus, and routes of tetanus toxin spread are discussed in the light of current concepts of the pathogenesis of tetanus.

70. Kryzhanovskiy, G. N., L. A. Pevnitskiy, V. N. Grafova, and A. A. Polgar. Routes of tetanus toxin attack on the CNS and some problems of the pathogenesis of experimental tetanus. Report 4. Pathogenesis of ascending and descending tetanus. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 12, 1961, 30-38.

In donkeys and other animals, tetanus toxin injected into the muscles of the shank passes along the sciatic nerve and reaches the spinal cord through the anterior roots. Under normal conditions, the course of tetanus after intramuscular administration of the toxin in lethal doses into the extremity is of the so-called descending type. If the circulatory route of toxin spread is blocked by tetanus antiserum, tetanus of the ascending type develops, starting locally with increased bioelectric activity of the muscles into which the toxin was injected. Local tetanus may also be provoked by minimal doses of the toxin (1/50 DLM) administered into muscles of the extremity. Ascending tetanus develops by spread of the toxin from the administration site along the regional nerve and the anterior roots into the spinal cord, whereas descending tetanus develops by circulatory spreading of the toxin. When the main mass of the toxin enters the circulation and a relatively small amount of it passes along the nerves, general tetanus develops before local tetanus has time to appear. This mechanism occurs in donkeys. It is suggested that the mechanism of descending tetanus in other animals, including man, is analogous to this.

71. Kudryashov, Yu. B. Radiomimetic properties of oxidized oleic acid.
Biologicheskiye nauki, no. 1, 1962, 102-104

72. Kulik, N. M. Influence of hyaluronidase aerosols on the absorbability of inhaled antitubercular preparations. Vrachebnoye delo, no. 6, 1962, 74-77.

Hyaluronidase aerosols were used to increase the absorption properties of inhaled antitubercular preparations. Results were evaluated by determining para-aminosalicylic acid in the urine. Three hundred and ten determinations were made for 41 patients. It was found that hyaluronidase aerosols increase the absorption properties of inhaled antitubercular preparations, causing no side effects. The use of hyaluronidase aerosols with antitubercular preparations for treatment of cavernous forms of pulmonary tuberculosis is recommended.

1. Layko, A. V. Effect of some antitumor antibiotics on the synthesis of nucleic acids in staphylococcus cells. Antibiotiki, v. 7, no. 7, 1962, 601-605.

The effect of the antitumor antibiotics mitomycin C, actinomycin C, olivomycin, antibiotic 6270, and the synthetic antitumor drug degranol on the synthesis of nucleic acids in staphylococcus cultures was studied. Nucleic acids were extracted from the cells with a 10% solution of perchloric acid. The DNA and RNA content of the extracts was determined by diphenylamine and orcin reactions. The results show that mitomycin C selectively affects DNA synthesis. Actinomycin, mitomycin C, olivomycin, and antibiotic 6270 have the same effect on RNA. The action of degranol is less specific, since its presence in the medium inhibits the synthesis of both nucleic acids to the same degree in staphylococcus cultures. The method used to analyze the inhibiting effect of antibiotics on nucleic acid synthesis in staphylococcus cells is quite convenient and can be used in the early stages of studies of the mechanism of action of various new antibiotics.

14. Leont'yeva, Yu. A. Identification of some viral diseases of the potato. Biologicheskkiye nauki, no. 3, 1962, 158-162.

75. Lerner, I. P., and F. V. Andrushchenko. Treatment of chronic cor pulmonale with cardiac glycoside aerosols. Vrachebnoye delo, no. 5, 1961, 22-25.

Cardiac glycoside aerosols (strophanthin, corglycon, convallotoxin) were used for treatment of patients with chronic cor pulmonale complicated by circulatory insufficiency. It was found that glycoside aerosols are an effective method of treatment, having some advantages over intravenous glycosides (less danger of thrombus mobilization, prevention of "strophanthin death," etc.). Absorption of glycoside aerosols from the broncho-pulmonary system into the bloodstream is slow. The large surface area of the aerosols gives the drug (by deep penetration into the lungs) greater effectiveness on the receptors of the respiratory apparatus. When necessary, cardiac glycosides may be combined with other drugs (antibiotics, broncholytics, and desensitizing preparations) in the aerosol mist.

76. Makárovskaya, L. N. Dry streptomycin aerosols in prompt plague prophylaxis. Antibiotiki, v. 5, no. 3, 1960, 38-41.

In guinea pigs and white mice intranasally inoculated with a virulent strain of Pasteurella pestis, a single application of streptomycin in the form of dry aerosol occasionally sufficed to prevent development of the disease. The best preventive effect was obtained when streptomycin administration was begun shortly before or soon after inoculation with the plague pathogen.

2. Maslov, A. I. Effectiveness of the inhalation method of immunization. Communication II. The immunological effectiveness of inhalation immunization with killed vaccine utilizing medium and finely dispersed aerosols. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 31, no. 4, 1960, 10-15.

White mice, guinea pigs, and rabbits were placed in a special chamber, where a vaccine aerosol with a definite density and dispersion rate was created by dispersing thick suspensions of killed bacteria. It was shown that inhalation immunization with killed *Salmonella enteritidis* vaccine causes pronounced immunological readjustment, shown by sharp increase of agglutinin titres and good indices of the serum preventive properties. Vaccine aerosols with particles ranging in size from 4 to 10 μ gave much higher immunological indices than those made up of larger particles. In triple immunization of rabbits with finely dispersed vaccine aerosol, the average agglutinin titres reached 1:29440, 8.3 times greater than agglutinin titres obtained with triple subcutaneous vaccination. The serum preventive properties in animals immunized by the inhalation method were also higher. Reactions to the inhalation method were insignificant and no more intense than reactions to subcutaneous inoculations.

3. Moroz, A. F. Dehydrogenase, catalase, and peroxidase activity of staphylococcus cultures with acquired resistance to antibiotics of the neomycin group. Antibiotiki, v. 7, no. 2, 1962, 143-150.

In the sensitive *Staphylococcus aureus* strain no. 5, activity of the dehydrases involved in the tricarboxylic acid oxidation cycle (pyruvic, oxalo-acetic, α -ketoglutaric, iso-citric, succinic, and fumaric acids) is high the 6th and 24th hours (20 to 90 γ /ml), but drops off by the end of 48 hours. In staphylococci with acquired resistance to antibiotics of the neomycin group (mycerin, colimycin, canamycin, monomycin, and neomycin), there is a sharp drop in the activity of dehydrases involved in the tricarboxylic acid cycle: only small quantities (3 to 25 γ /ml) are detected of malic, oxalo-acetic, and pyruvic acids, and iso-citric acid is completely absent. Evidently antibiotics of the neomycin group inhibit the tricarboxylic acid cycle. Somewhere in the site of the condensation of pyruvic and oxalo-acetic acids into iso-citric acid and further reduction in the tricarboxylic acid cycle, there is some detour open to carbohydrate metabolism but closed to the action of antibiotics of this particular group. In cultures with acquired resistance to compounds of the neomycin group, there is an abrupt drop in catalase activity. Only in the neomycin-resistant variant is catalase activity at a higher level than in other strains resistant to drugs of this group. The activity of free and bound peroxidase in staphylococci with developed resistance to neomycin group antibiotics is also at a lower level than in the initial antibiotic sensitive culture.

79. Murontsev, S. N., and V. P. Nenashev. Study of aerosols. Communication IV. An insulated chamber for experiments with inhalation immunization. Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 32, no. 9, 1961, 25-26.

The paper describes an insulated chamber and its equipment for experiments on inhalation immunization of laboratory animals.

80. Nestor, I. D. Changes in Bacillus anthracis due to penicillin. Communication II. The appearance of coccus-like variants. Antibiotiki, v. 7, no. 4, 1962, 296-305.

During culturing of Bacillus anthracis, other variants besides the L-forms (spheres) which occur on penicillin nutrient media, sometimes appear. These variants have the morphology of Gram-positive cocci and produce characteristic colonies of the S-type, but have biochemical properties close to those of the initial bacteria. These coccoid variants differ considerably from the initial strains not only in their morphological and culture characteristics, but also in their antigenic structure and sensitivity to anthrax phage. The coccoid variants revert to bacillary forms even after a number of passages performed on solid nutrient media over 3-4 years, and thus regain all of their initial properties.

81. Nestor, I. D. Changes in bacillus anthracis due to penicillin. Communicatio. I. An attempt to produce L-form bacteria. Antibiotiki, v. 7, no. 3, 1962, 71-75.

A study was made of the evolution of spheres developed from *Bacillus anthracis* (vegetative forms and spores) on liquid and semi-liquid media having normal or elevated osmotic pressure and containing penicillin. On media with penicillin concentrations of 0.1 to 50 units per ml, spheres develop quickly (within the first 1 to 2 hours of incubation) and reach the ultimate stage in their development, when some of them begin to divide, in 6 to 9 hours. Some spheres subsequently become lysed and disappear, while others revert through a series of intermediate forms to the normal bacillary form. Spheres developed from spores have the same general morphology as those obtained from vegetative forms. Viable coccoid and coccobacillary granules, capable of reproduction, were found within some spheres.

82. Nikulina, G. A., O. K. Filippova, and V. D. Shtiben. Staining *Corynebacterium diphtheriae* granules. Laboratornoye delo, no. 2, 1962, 42-43.

83. Ozeretskovskiy, N. A. Use of secasine in experimental coccus infections. Antibiotiki, v. 6, no. 5, 1961, 409-412.

It is demonstrated that a new antibiotic, secasine, is effective in the treatment of pneumococcus and streptococcus sepsis as well as of localized staphylococcus infection in white mice. Ed_{50} of secasine has 3 to 5 times the activity of an intramuscular dose.

84. Pokrovskaya, Ye. I., P. S. Batayev, and L. V. Ryabykh. Testing new mosquito repellents under natural conditions in Voronezhskaya Oblast'. Biologicheskiye nauki, no. 3, 1962, 23-26.

85. Porfir'yeva, R. P. Effect of tetracycline group antibiotics on hepatic catalase activity. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 11, 1961, 54-57.

86. Prozorovskiy, V. B. Differences in the effects of tertiary and quaternary ammonium bases (proserin, eserine, methylatropine, and atropine) when administered by different routes. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 9, 1961, 73-77.

Different effects are produced in mice by tertiary and quaternary ammonium compounds, not only in subcutaneous administration but also after administration into the cerebral ventricles. Methylatropine tolerance is lower than atropine tolerance in mice; this difference diminishes if intracerebral instead of subcutaneous administration is used. It is suggested that the hematoencephalic barrier of mice is permeable to quaternary ammonium compounds. Differences in the central effects of tertiary and quaternary ammonium bases should not be attributable to the varying effectiveness of the hematoencephalic barrier against them.

87. Rudzit, E. A. Distribution of penicillin in the bodies of rabbits under conditions of experimental staphylococcus intoxication. Antibiotiki, v. 6, no. 5, 1961, 422-427.

The distribution of penicillin in the bodies of rabbits with experimental staphylococcus intoxication was studied to clarify the characteristics of circulation of antibiotics during infectious processes. The experimental animals showed a marked retention of the drug in the blood and organs, caused partly by its impaired kidney excretion, and partly by delayed absorption of the drug from the site of administration. Increased permeability of biological barriers for penicillin during staphylococcus intoxication was also observed.

88. Rudzit, E. A. Renal and extrarenal elimination of penicillin from the blood plasma in normal rabbits and in rabbits with experimental staphylococcus intoxication. Antibiotiki, v. 7, no. 6, 1962, 531-537.

Plasmatic and renal elimination of penicillin was compared in rabbits under normal conditions and in experimental staphylococcus intoxication. The concept of "extrarenal clearance" was introduced to characterize quantitative extrarenal excretion of the drug. Plasmatic elimination of penicillin was observed to decrease during experimental poisoning with staphylococcus toxins. It was found that the elimination of the drug by the kidneys under these conditions decreases chiefly because of the effect of poisoning on the tubular secretion mechanism. The importance of the extrarenal factor in the removal of penicillin from the organism of rabbits is greater during staphylococcus infection, due to the fact that extrarenal elimination of the drug is affected less than renal elimination under the pathological conditions studied. Decrease of the "apparent" volume of penicillin distribution was noted following the administration of a staphylococcus toxin to the animals.

89. Rudzit, E. A. Distribution of penicillin in the organisms of rabbits during experimental staphylococcus infection. Antibiotiki, v. 7, no. 12, 1962, 1067-1071.

The two-stage decrease of blood plasma penicillin concentration in rabbits with acute staphylococcus sepsis was abruptly moderated due to lessened renal (and to a lesser degree extrarenal) elimination of the drug. When the disease takes a chronic course, the rate of renal elimination considerably decreases, while extrarenal elimination increases, so that the time taken by the two-stage decrease in penicillin concentration in the plasma remains unchanged. A decrease in the volume of distribution of the antibiotic in acute and chronic infections was noted.

90. Ryabov, F. P. A medium for use in quantitative evaluation of saprophytic H_2S -producing bacteria. Laboratornoye delo, no. 1, 1962, 50-51.

91. Sakanyan, S. Sh. Effect of chlortetracycline on blood regeneration in acute hemorrhage. Antibiotiki, v. 7, no. 6, 1962, 519-522.

Data have been obtained showing that penicillin, phenoxymethylpenicillin, streptomycin, ecmolin, and ecmonovocillon have a stimulating effect on posthemorrhagic erythropoiesis. The effect greatly depends on the mode of administration of the drugs. Chlortetracycline was found to have the same effect on posthemorrhagic erythropoiesis. Chlortetracycline, administered daily to rabbits in a dose of 10 mg following acute blood loss, had a strong stimulating effect on erythrocytes regeneration and hemoglobin synthesis. It also accelerated normalization of the reticulocytic reaction of bone marrow. However, chlortetracycline had little effect on the posthemorrhagic leukopoiesis.

92. Samofalov, A. I. A method for staining tissue cultures, histological sections, and various viruses by silver impregnation. Laboratornoye delo, no. 1, 1962, 53-54.

3. Samoylovich, N. N. Development of resistance to antibiotics in staphylococcus as a function of the length of antibiotic therapy. Antibiotiki, v. 6, no. 3, 1961, 270-276.

The sensitivity to a number of antibiotics and changes in sensitivity in the course of antibiotic therapy were studied in 746 strains of staphylococci isolated from patients in Sverdlovsk. It was found that prior to treatment, penicillin-resistant staphylococci were detected in 64% of the patients, bicillin-resistant in 65%, streptomycin-resistant in 38.9%, oxytetracycline-resistant in 16.2%, levomycetin-resistant in 4.7%, and chlortetracycline-resistant in 3.2% of the patients. Further increase in the number of antibiotic-resistant forms was observed during antibiotic therapy, the figures being as follows: 90.8% resistant to penicillin, 85.8% resistant to bicillin, 45.6% resistant to streptomycin, and 15.3% resistant to chlortetracycline.

14. Sazykin, Yu. O., and G. N. Borisova. The effect of bacteriostatic antibiotics on protein and nucleic acid synthesis in staphylococcus aureus cells. Antibiotiki, v. 7, no. 11, 1962, 975-979.

In selecting biochemical tests for comparing and contrasting the mechanisms of action of various antimicrobial substances, the effect of bacteriostatic antibiotics on the synthesis of protein, RNA, and DNA in the cells of Staphylococcus aureus was studied. Chloramphenicol and oxytetracycline inhibited protein synthesis, but had no effect on RNA and DNA synthesis. Erythromycin inhibited protein synthesis and only partly affected RNA synthesis. In bacteriostasis caused by albomycin, the synthesis of protein and RNA were both stopped. Bacteriostasis caused by the nonspecific action of dimethylormamide was accompanied by simultaneous inhibition of protein, RNA, and DNA synthesis. The data obtained indicate the need for further study of the synthetic processes mentioned for comparison of the mechanisms of action of bacteriostatic substances.

95. Shipitsina, G. K., R. A. Savel'yeva, I. V. Rodionova, and L. S. Kolyaditskaya. Further investigation of specific factors of the tularemia microbe causing rapid allergic reaction. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 9, 1961, 83-88.

96. Shub, G. M. Dehydrase and cytochrome oxidase activity of levomycetin-sensitive and levomycetin-resistant typhoid bacilli. Antibiotiki, v. 6, no. 5, 1961, 437-441.

The activity of oxidative enzymes of glucosodehydrase and cytochrome oxidase was studied in 17 strains of *Salmonella typhosa*, 10 of which proved sensitive (2.5 to 10 γ /ml) and 7 resistant (40 to 480 γ /ml) to levomycetin. It was found that in the resistant strains dehydrase activity was 3.3 times greater, and cytochrome oxidase activity 2.7 times greater, than in the sensitive strains. Increased activity was observed both in naturally resistant strains (isolated from patients) and in strains artificially adapted to levomycetin.

97. Sobolev, V. R., and Yu. F. Shcherbak. Treatment of brucellosis patients with intramuscular tetracycline injection. Antibiotiki, v. 7, no. 3, 1962, 79-83.

The effectiveness of intramuscular administration of tetracycline in chronic brucellosis was studied. A total number of 25 cases were observed. Positive results were obtained in all but 2 cases. Intramuscular administration of tetracycline (100 to 200 mg in 2% novocaine in 24 hours) is well tolerated by patients and has no side effects. Intramuscular administration of 50 to 100 mg of tetracycline twice daily creates a good therapeutic concentration of the drug in the blood serum.

98. Somova, A. G. Phage and antibiotic therapy of experimental cholera. Antibiotiki, v. 7, no. 2, 1962, 128-135.

It was found that oxytetracycline, chlortetracycline, and dihydrostreptomycin have a synergic effect on the lytic activity of the cholera bacteriophage when used against phage-sensitive strains of *Vibrio comma* in the organism of experimentally infected guinea pigs. In experiments *in vivo* using relatively bacteriophage-resistant strains of *Vibrio comma*, lytic activity of the bacteriophage decreased considerably under the effect of tetracycline series antibiotics, instead of increasing. This contradicts the combination of bacteriophage and tetracycline antibiotic therapy in cholera. In cholera, antibiotics should evidently be administered only when the bacteriophage fails to act. In the intestine and gall bladders of guinea pigs infected with antibiotic-resistant forms of *Vibrio comma*, the phage lyses the bacteria to the same degree as it does the initial strains. The only exceptions are forms having cross-resistance to two antibiotics. Phage therapy should thus be the main etiotropic method in cases involving antibiotic-resistant forms of *Vibrio comma*.

99. Ter-Karapetyan, A. Z. The problem of length of observation of mice infected with various enterogenic bacteria. *Laboratornoye delo*, no. 2, 1962, 43-45.

100. Terskikh, I. I., V. M. Bolotovskiy, and A. Yu. Bekleshova. Characteristics of aerosol infection in ornithosis. *Voprosy virusologii*, v. 6, no. 4, 1961, 463-469.

The pathogenesis and clinical picture of ornithosis were studied using mice and monkeys infected by inhalation of pure ornithosis virus aerosol in a special chamber. Four to seven days later, the monkeys showed characteristic lung lesions analagous to those in humans with ornithosis. The patterns of distribution and accumulation of the virus in the blood and organs of mice and of the development of pathomorphological changes indicate that primary localization of the agent and development of the pathological process occurs in the respiratory tract. This is followed by hematogenic spread of the infection and development of lesions in parenchymatous organs. Aerosol infection with ornithosis is characterized by diffuse lung lesions followed by the development of larger, rapidly consolidating pneumonic foci. The development of lung lesions is correlated with the incubation period and the rise of virus titre in lung tissue. Consideration of the basic method of infection in ornithosis and its pathogenesis are essential to the devising of effective therapy and epidemic countermeasures.

101. Mitarenko, I. F. Experimental observations of polyvalaccine immunization with anatoxin aerosols (tetanus and staphylococcus). Zhurnal mikrobiologii, epidemiologii i immunobiologii, v. 33, no. 2, 1962, 8-14.

Highly purified concentrated anatoxins (tetanus and staphylococcus) administered by the inhalation method produced a marked immunological reaction in guinea pigs and rabbits. There were no essential differences between the antibody titres of animals subjected to mixed staphylococcus-tetanus immunization and those immunized separately with aerosols of the aforementioned antigens. A direct relationship was noted between the rise of antitoxin titre and the increase of dose of one or another component of anatoxin mixture: some inhibition of tetanus antibody production was noted following administration of a triple dose of staphylococcus anatoxin. Aerosol reimmunization following primary subcutaneous vaccination was especially effective. Electrophoretic study of the serum of experimental guinea pigs showed an approximately two-fold rise of globulin, and some increase of the β -globulin fractions.

102. Tsvetkova, Ye. M. Therapeutic action of monomycin in experimental tularemia. Antibiotiki, v. 6, no. 4, 1961, 327-330.

Monomycin was found to have antibacterial action on virulent Pasteurella tularensis in experiments *in vitro* using an initial strain and an experimentally obtained streptomycin-resistant variant. Monomycin showed a good therapeutic action in white mice and guinea pigs infected with the initial strain and the streptomycin-resistant variant of Pasteurella tularensis. Monomycin was nontoxic for guinea pigs, which is an advantage over the tetracycline series antibiotics. Monomycin is recommended for clinical trials on tularemia patients.

103. Uraleva, V. S. Dynamics of formation of antibiotic-resistant forms of *Brucella*. *Antibiotiki*, v. 6, no. 3, 1961, 262-265.

Passaging in broth containing antibiotics resulted in the production of highly levomycetin-, chlortetracycline-, tetracycline- and streptomycin-resistant forms of two strains of *Brucella melitensis* and two strains of *Brucella abortus*. The brucella strains resistant to streptomycin showed no change in their sensitivity to other antibiotics, and vice versa. The brucella strains that developed increased resistance to levomycetin, chlortetracycline, or tetracycline showed cross resistance to all of these drugs. It should be pointed out that the highest degree of cross resistance was observed in the brucella strains trained to levomycetin, and the lowest in the brucella strains trained to tetracycline.

104. Vlodavets, V. V. Experimental model of the dry phase of a bacterial aerosol. *Zhurnal mikrobiologii, epidemiologii i immunobiologii*, v. 31, no. 10, 1960, 56-62.

Dust obtained from blankets was first sifted through a sieve and then sterilized by dry heat at 150-160°C for a period of 2 hours: 0.8 to 1 g of the dust was contaminated with 10 to 12 ml of thick *Staphylococcus albus* suspension in saline (40 to 50 billion microbes per ml). Bacterial dust dried in a thermostat was triturated in a mortar, and then various samples of bacterial dust were dispersed in an experimental chamber. Batches of 20 to 30 mg were most convenient. Bacterial dust prepared in this manner can only be used for a period of 5 to 10 days, due to the rapid death of staphylococci. Dust dried by lyophilization and kept at a temperature of 2 to 4°C may be used for serial experiments for at least 35 days, while dust kept at room temperature and 37°C may be used for at least 20 days.

105. Vlodavets, V. V., S. Ya. Gaydamovich, and V. R. Obukhova. Technique for detection of influenza virus in the drop phase of aerosols. Communication II. Effectiveness of detecting influenza virus with Rechemskiy's bacterial recovery apparatus, Vershigora's barbotage apparatus, and Shafir's aerocentrifuge. Voprosy virusologii, v. 8, no. 6, 1960, 670-675.

Studies were made of the effectiveness of aerosols of various adsorbing fluids in trapping influenza virus in Rechemskiy's bacterial recovery apparatus, Vershigora's barbotage apparatus, and Shafir's aerocentrifuge. It was found that with Rechemskiy's apparatus the adsorption and detection of influenza virus were optimal in glucose broth and milk, while with Vershigora's barbotage apparatus and Shafir's aerocentrifuge, milk and a 10% chicken red cell suspension in saline were best. A comparative study of all apparatus, using the most effective adsorbing fluids, showed that Rechemskiy's apparatus possesses the highest detecting ability with respect to influenza virus aerosol. The next most effective was Vershigora's barbotage apparatus, followed by Shafir's aerocentrifuge and D'yakonov's apparatus. Krotov's apparatus and soluble gelatin foam filters were the least effective.

106. Yarovoy, L. V., V. F. Biryukova, and V. A. Shalomayenko. Results of treatment of brucellosis patients admitted to hospital during the generalized phase with antibiotics and vaccine. Antibiotiki, v. 6, no. 3, 1961, 238-240.

107. Yarovoy, L. V., and A. M. [unclear]. Therapeutic effectiveness of intramuscular oxytetracycline and per ora cyanophycin in experimental brucellosis. Antibiotiki, v. 7, no. 11, 1962, 989-996.

Pathological and histological changes and peculiarities of bacteremia were studied in white mice with experimental brucellosis after intramuscular administration of oxytetracycline. The peculiarities of bacteremia and elimination of Brucellae after internal administration of cyanophycin were also studied. Over 100 white mice were used in the experiments. Intramuscular administration of oxytetracycline had a bacteriostatic effect on Brucellae and decreased the number of pathological changes in the internal organs, especially in the lungs. Pathological changes in the lungs of mice reached their minimal level after 3 cycles of oxytetracycline, while the lowest index of Brucella inoculability was recorded after four 10-day cycles of therapy. It is recommended that a four-cycle course of oxytetracycline therapy be carried out during the bacteremia stage in cases of brucellosis of the sheep-goat type. The bacteriostatic action of cyanophycin in experimental brucellosis of mice was much weaker than that of oxytetracycline.

108. Yermol'yeva, Z. V., T. V. Goloseva, Ye. A. Ved'mina, V. A. Shenderovich, and N. A. Zhukovskaya. Use of lysozyme for treatment of pathogenic staphylococcus carriers. Antibiotiki, v. 7, no. 4, 1962, 359-361.

The Microbiology Department of the Central Institute for Postgraduate Medical Studies obtained purified crystalline lysozyme by direct crystallization from egg albumen. A study of the antiseptic action of the lysozyme, alone and in combination with ecmolin, in experimental staphylococcus infection of white mice, demonstrated that the administration of these drugs 6 to 24 hours prior to inoculation prevents the development of staphylococcus sepsis in these animals. Lysozyme and the lysozyme-ecmolin combination were used for antiseptics of pathogenic staphylococcus carriers in a maternity home. It was shown that these measures are highly effective in controlling the pathogenic staphylococcus carrier-state among the medical staff.

109. Zhukov-Verezhnikov, N. N., I. N. Mayskiy, and G. P. Tribulev.
Experimental biology and new notions in immunology. Akademiya
meditsinskih nauk SSSR. Vestnik, no. 4, 1962, 65-70.

V. Chemical Substances

110. Anisimova, A. P. On the question of the adaptation of the visual apparatus to natural illumination. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 7, 1961, 18-20.

It is shown that natural illumination determines the corresponding adjustment of the retina. Especially interesting is the moment of change from daylight to dusk vision under natural conditions. Examination of retinal light sensitivity has shown the change from daylight to dusk vision to consist in increased light sensitivity and activity of the rods after sunset.

111. Artemov, N. M. The effect of animal toxin poisoning on the higher nervous activity of mammals. Biologicheskiye nauki, no. 1, 1962, 88-92.

112. Partinyan, T. M. Anesthesia in moderate hypothermia. IN: Akademiya meditsinskikh nauk SSSR. Vestnik, no. 8, 1962, 39-43.

113. Denisenko, P. P. Experimental basis for use of central cholinolytics in medical practice. IN: Akademiya meditsinskikh nauk SSSR. Vestnik, no. 3, 1962, 48-58.

114. Fishchenko, L. Ya., and Ye. M. Neyko. The problem of the effect of toad poison on the healing of experimental wounds. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 12, 1961, 93-95.

A study was made of the effect of toad poison on the healing of experimentally induced skin wounds measuring 350 mm² in guinea pigs weighing from 450 to 650 g. Daily administration for 8 days of a dose of 0.1 ml/100 g body weight of toad poison led to greater increases in body temperature and leukocyte count, and more rapid restoration of these indices to normal levels. Toad poison reduced the healing period of skin wounds.

115. Frantsevich, L. I., and O. V. Viktorov-Nabokov. Dispensing small doses of poisons using calibrated capillary tubes. Laboratornoye delo, no. 4, 1962, 58-59.

116. ber, L. M., and I. R. Runde. Effect of a new ganglion blocking substance - tetramine - on the reactivity of the body to insulin. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 12, 1961, 53-60.

The effect of tetramine, a new ganglion blocking substance synthesized at the Institute of Organic Synthesis of the Latvian SSR Academy of Sciences, on the character of hypoglycemia caused by intramuscular insulin administration was studied. The results show that subcutaneous injection of tetramine 30 minutes prior to insulin administration always leads to a more pronounced reduction of blood sugar level than insulin alone. In a considerable number of cases, the blood sugar level dropped markedly before the end of the experiment and hypoglycemic convulsions occurred. Tetramine thus increases the sensitivity of rabbits to insulin. The data obtained show that particular care should be taken in prescription of insulin in patients under treatment for hypertensive disease, diabetes, endarteritis, etc., since against a background of tetramine therapy the usual therapeutic doses of insulin may cause dangerously severe hypoglycemic phenomena.

117. Gromova, Ye. A., K. N. Tkachenko, and G. A. Romanova. Experimental basis for aminazine therapy of tetanus. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 12, 1961, 38-43.

Chronic experiments were performed on rabbits with electrodes implanted in the brain. The role of the reticular formation in the origin of motor disturbances in tetanus was established. It was shown that aminazine blocking of the reticular formation eliminates nonspecific afferent stimulations (e. g., auditory, tactile, etc.) from the symptom complex of tetanus. This is evidently the basis of the mechanism of its therapeutic effect.

118. Il'inskiy, Yu. A. Immunological reactivity of schizophrenia patients during reserpine therapy. IN: Akademiya meditsinskikh nauk SSSR. Vestnik, no. 1, 1962, 43-51.

119. Karakchiyev, N. I., and V. N. Yakobson. Effect of chloral hydrate on diphosgene edema of the lungs. Patologicheskaya fiziologiya i eksperimental'naya terapiya, v. 6, no. 2, 1962, 50-54.

Preliminary administration of chloral hydrate to rats (in hypnotic doses) considerably inhibited the development of diphosgene edema of the lungs. Low doses of chloral hydrate (causing light sleep) after poisoning of the animals not only did not reduce diphosgene edema, but usually intensified it.

120. Korbikov, O. V. Immunological reactivity in schizophrenia as influenced by some modern drugs. IN: Akademiya meditsinskikh nauk SSSR. Vestnik, no. 1, 1962, 36-43.

(Footnote states that this paper was presented on 15 Oct 1960 at a meeting of the New York Academy of Sciences devoted to Pavlov's work on higher nervous activity.)

Available in English IN: New York Academy of Sciences. Annals, v. 92, article 3, 1961, 1098-1105.

121. Korablev, M. V. Potentiation of medicated sleep by means of 6-methylthiouracil and hydroturbanic acid. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 8, 1961, 67-70.

122. Korkhov, V. V. The effect of sodium phenylethylacetate, vanadyl sulfate, and combinations of the two on the onset and course of experimental atherosclerosis. *Patologicheskaya fiziologiya i eksperimental'naya terapiya*, v. 6, no. 6, 1962, 35-40.

123. Kotlyar, B. I., and D. A. Fless. The effect of corazol on the central nervous system. *Biologicheskiye nauki*, no. 2, 1962, 98-103.

124. Kovalev, V. V. Dynamics of the psychic state in patients following brief periods of clinical death. IN: Akademiya meditsinskikh nauk SSSR. Vestnik, no. 7, 1962, 17-22.

125. Kovanev, V. A., and Ya. N. Starilevskiy. Fleksivnyy in modern anesthesia. IN: Akademiya meditsinskikh nauk SSSR. Vestnik, no. 8, 1962, 3-10.

126. Kovtunovich, L. G., and Ye. A. Shablovskaya. Interrelation between allergy and the level of tetanus antitoxin immunity. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 11, 1961, 85-88.

A study of the interrelationship between allergy and the blood antitoxin level was carried out in 30 guinea pigs and 24 rabbits immunized with crude and with purified, concentrated, and sorbed tetanus toxoid. Allergic reconstruction was assayed by local reactions to repeated subcutaneous and intradermal tetanus toxoid injections. The study shows that although the extent of allergic reconstruction is connected with the immunogenic properties of toxoids, no complete parallelism exists between the antitoxin level and the intensity of allergic reactions. There was also no definite antitoxin titre at which positive skin reactions appear. The appearance of allergy may be mainly related not to the level of antitoxin immunity, but to the quality and the number of administrations of the antigen. In using tetanus toxoids, immunity and increased sensitivity are evidently conditioned by the same antigen, and it is impossible to separate them from each other.

127. Krokhina, Ye. M. Histopathology of the nervous elements of the heart and aorta of dogs after intravenous administration of adrenalin and caffeine. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 8, 112-117.

128. Kryzhanovskiy, G. N., L. A. Pevnitskiy, V. N. Grafova, and A. A. Polgar. Routes of tetanus toxin attack on the CNS and some problems of the pathogenesis of experimental tetanus. Report 3. Experiments on monkeys and dogs. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 11, 1961, 35-43.

It has been shown by experiments on monkeys and dogs that the main direct route of tetanus toxin from the muscles to the spinal cord is the anterior spinal roots. This result agrees fully with data from previous investigations on albino rats, guinea pigs, rabbits, and cats. If the circulatory route of toxin spread is blocked by antiserum, intramuscular injection of toxin in the posterior extremity causes a fatal ascending tetanus in dogs; by the time of the animal's death, antitoxin may be in circulation in the blood. Spread of toxin by the blood is thus not prerequisite to the development of general fatal tetanus, though this factor is important in determining the clinical form and the outcome of the disease. In both monkeys and dogs, generalized CNS excitation results from stimulation of the toxin-injected extremity; this phenomenon is characteristic of ascending general tetanus, and has already been described by the authors. Clinical forms of tetanus, and routes of tetanus toxin spread are discussed in the light of current concepts of the pathogenesis of tetanus.

129. Kryzhanovskiy, G. N., L. A. Pevnitskiy, V. N. Grafova, and A. A. Polgar. Routes of tetanus toxin attack on the CNS and some problems of the pathogenesis of experimental tetanus. Report 4. Pathogenesis of ascending and descending tetanus. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 12, 1961, 30-38.

In donkeys and other animals, tetanus toxin injected into the muscles of the shank passes along the sciatic nerve and reaches the spinal cord through the anterior roots. Under normal conditions, the course of tetanus after intramuscular administration of the toxin in lethal doses into the extremity is of the so-called descending type. If the circulatory route of toxin spread is blocked by tetanus antiserum, tetanus of the ascending type develops, starting locally with increased bioelectric activity of the muscles into which the toxin was injected. Local tetanus may also be provoked by minimal doses of the toxin (1/50 DLM) administered into muscles of the extremity. Ascending tetanus develops by spread of the toxin from the administration site along the regional nerve and the anterior roots into the spinal cord, whereas descending tetanus develops by circulatory spreading of the toxin. When the main mass of the toxin enters the circulation and a relatively small amount of it passes along the nerves, general tetanus develops before local tetanus has time to appear. This mechanism occurs in donkeys. It is suggested that the mechanism of descending tetanus in other animals, including man, is analagous to this.

130. Lazaris, Ya. A., and I. A. Serebrovskaya. The reactions of pulmonary circulation vessels to chemical stimuli. Patologicheskaya fiziologiya i eksperimental'naya terapiya, v. 6, no. 1, 1962, 3-9.

(This is a survey article based on a bibliography of 176 items, of which approximately 12 are Soviet, the rest being taken from world literature.)

131. Morozova, T. N. Therapeutic effectiveness of psychopharmacological agents. IN: Akademiya meditsinskikh nauk SSSR. Vestnik, no. 1, 1962, 59-65.

132. Mukhitov, B. M. Experimental data for establishing maximal permissible levels of phenol concentrations in the atmosphere. Gigiyena i sanitariya, no. 6, 1962, 16-24.

133. Nadzharov, R. A. Psychotropic agents, their classification and therapeutic specificity. IN: Akademiya meditsinskikh nauk SSSR. Vestnik, no. 1, 1962, 51-58.

134. Neyman, I. M. Nucleoproteins and biological specificity. *Patologicheskaya fiziologiya i eksperimental'naya terapiya*, v. 6, no. 3, 1962, 85-88.

135. Nguyen, Nang An. The mechanism of inverse reaction to atropine in smooth muscle organs following anaphylactic contraction. *Patologicheskaya fiziologiya i eksperimental'naya terapiya*, v. 6, no. 3, 1962, 40-44.

It was demonstrated in sensitized guinea pigs that following anaphylactic contraction of the intestinal loop, atropine increased smooth muscle tone, instead of reducing it. An analagous phenomenon was produced in the uterus of sensitized guinea pigs. These results demonstrate the importance of the cholinergic processes in the development of the phenomenon.

136. Oyvin, I. A. Problems of the physiology and pathology of vascular permeability. Patologicheskaya fiziologiya i eksperimental'naya terapiya, v. 6, no. 3, 1962, 3-11.

(Review article based on 141 sources, of which approximately 45 are Soviet.)

137. Popenenkova, Z. A., and T. N. Zavenyagina. The effect of pyrogenal on serotonin and histamine blood levels. Patologicheskaya fiziologiya i eksperimental'naya terapiya, v. 6, no. 5, 1962, 68-69.

138. Prozorovskiy, V. B. Differences in the effects of tertiary and quaternary ammonium bases (proserin, eserine, methylatropine, and atropine) when administered by different routes. Byulleten' eksperimental'noy biologii i meditsiny, v. 52, no. 9, 1961, 73-77.

Different effects are produced in mice by tertiary and quaternary ammonium compounds, not only in subcutaneous administration but also after administration into the cerebral ventricles. Methylatropine tolerance is lower than atropine tolerance in mice; this difference diminishes if intracerebral instead of subcutaneous administration is used. It is suggested that the hematoencephalic barrier of mice is permeable to quaternary ammonium compounds. Differences in the central effects of tertiary and quaternary ammonium bases should not be attributable to the varying effectiveness of the hematoencephalic barrier against them.

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Experiments on rats demonstrated that sympatholytin (the bromine analog of dibenamine) can prevent the appearance of tremor following injection of nicotine, arecoline, eserine, and di-isopropylfluorophosphate; tends to diminish tremor after injections of phosphacol; but has no effect on tremor provoked by proserine. It is suggested that "tremor" paths, originating in both M- and H-cholinoreactive neurons of the CNS, include an adrenoreactive link.

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Experiments were performed on guinea pigs and white mice. An inquiry was made into the effect of choline-sensitizing and cholinolytic substances on tetridine hyperkinesis in guinea pigs. Tetridine, like many barbiturates, causes stem hyperkinesis in addition to its anesthetic effect in many animals. Cholinolytics (atropine, scopolamine, tropecine, pentaphen, arpenal, methyldiasil, and methyldifacil) do not prevent tetridine hyperkinesis in mice. Atropine and methyldiasil do not depress hyperkinesis in guinea pigs. Choline-sensitizing (anticholinesterasic) agents depress tetridine hyperkinesis temporarily. This effect may be repeatedly produced in the same animal. Inhibition of tetridine hyperkinesis by a choline-sensitizing agent may be prevented by a cholinolytic substance (e. g., atropine).

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